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considered to be in a class by itself; but it has now got companions, so that this subterfuge disappears. The substitution of names for numerals is certainly more poetic, and abbreviations may be devised which would take no more space in printing than the present notation (e.g. *Io.*, *Eu.*, *Gan.*, *Cal.* for the four old satellites).

It may help to realise the relative distances of satellites from their primaries to point out that the distances of satellites V. and VI. from *Jupiter* are comparable with those of *Mercury* and *Uranus* from the Sun, while those of *Mimas* and *Phœbe* are comparable with those of *Mercury* and *Neptune.*

Benvenue, 55 *Ulandi Road, Blackheath, S.E.:*
1905 *March* 8.

The Later Leonids of 1904 *November.*

By Rev. S. J. Johnson, M.A.

As most of the observations obtained of this shower relate to what was seen in the earlier hours of the morning of November 15 last, they may perhaps be supplemented by some notes on the meteors nearer sunrise, or between 3.30 and 5.30 A.M. A perfectly clear sky and the absence of even the crescent Moon of 1903 favoured the display. During the two hours aforesaid I noticed twenty-five meteors (not quite all Leonids) between 3.30 and 4.30, and thirteen between 4.30 and 5.30; but from the circumscribed portion of the heavens presented to the observer through obstructions and the delay occasioned by recording the tracks it would be probably correct to multiply this number by 4. This would make just 100 meteors in the two hours. Comparing with 1903, when I noticed fifty-three in $1\frac{3}{4}$ hour, equivalent to about sixty in two hours, and multiplying again by 4, we obtain 240 for the same hours in the morning in 1903. This makes the stream of 1903 two and a half times as plentiful as that of 1904. A noteworthy point was the intense green colour of the larger ones, probably magnesium. Eleven were = ordinary 1st-magnitude stars, one = *Vega*, two = ♃, and one = ♀. The three brightest meteors seen were $14^{d}\ 16^{h}\ 10^{m} =$ ♃, across *Com. Beren.* $175^\circ + 28^\circ$ to $198^\circ + 28^\circ$, $14^{d}\ 16^{h}\ 14^{m} =$ ♀, very green. From about $195^\circ + 22^\circ$ to about $202^\circ + 18^\circ$, $14^{d}\ 17^{h}\ 16\frac{1}{4}^{m} =$ ♃, across χ *Leonis,* almost to *Mars*, $155^\circ + 19^\circ$ to $167^\circ + 5^\circ$.

Melplash Vicarage, Bridport:
March 4.

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The Great Nebula of ψ Eridani. By Dr. Max Wolf, Assoc. R.A.S.

I have had much difficulty in securing a photograph of this large nebula. It is situated somewhat too far south for our latitude, and between very bright stars, so that the sky here has never yet been sufficiently clear for me to obtain a perfect image. I do not know if the nebula is known elsewhere—it is not in the N.G.C. nor in the Index Catalogue. The small nebulæ 398 and 402 in the Index Catalogue seem to be included in this enormous nebula, as well as N.G.C. 1779, 1797, 1799, but they are all relatively small and difficult objects. Perhaps Professor Barnard has also photographed this object.

The nebula now reproduced is situated between λ *Orionis* and ψ *Eridani*, not far from the first-magnitude star β *Orionis*.

The first traces of this nebula were found on a plate taken on 1891 January 16 with a 4-inch Millet portrait lens and with 1^h exposure. It appears on many plates, including those of 1894 November 24 (in the centre of the plate); 1896 February 3, 7; 1899 February 3, 4, 10; 1900 March 1, &c., till 1904 November 16—all taken with smaller lenses up to 6 inches.

The accompanying plate (15, Fig. 1) is from a photograph taken with the 16-inch Brashear lens on 1905 January 8, with $4^h\ 21^m$ exposure. It was not wholly satisfactory on account of haze, to which is due the large halos round the bright stars. But the weather has since been too unfavourable for me to repeat the exposure, and now it is too late in the spring for this latitude.

The bright star on the right is ψ *Eridani*. The denser parts of the nebula extend along the boundaries of *Orion* and *Eridanus*. There is no doubt that it is attached to the *Orion* nebulæ, all plates showing numerous traces of connexion. The nebula is composed of several streams of nebulosity, and has the appearance of foggy clouds driven by a fresh breeze. It belongs to the same class as Barnard's great nebula near ξ *Persei*, and in many features these two objects singularly agree. The scale of the reproduction is about 4 cm. to 1°.

To illustrate its position in reference to the *Orion* nebulæ I give (plate 16) a sketch of the southern part of *Orion*, in which I have outlined from my plates the principal nebulous branches.

A is the great *Orion* nebula, B its well-known northern branch around c *Orionis*, C is the beautiful nebula following ζ *Orionis*, D its southern branch, &c. K, L, M, O, Q are especially bright clouds of the large spiral; E is a denser stream near ε *Orionis*; the exceedingly interesting wisps U, V, W are placed around and west of η *Orionis*; T and Q_1 are especially strong clouds. Dense diffused nebulosity extends for some distance round S. The central part of southern *Orion* between P, T, R, E is relatively without nebulosity.

The ψ *Eridani* nebula is marked Z on the chart. It is not far from β *Orionis*, and nearly midway between λ *Orionis* and

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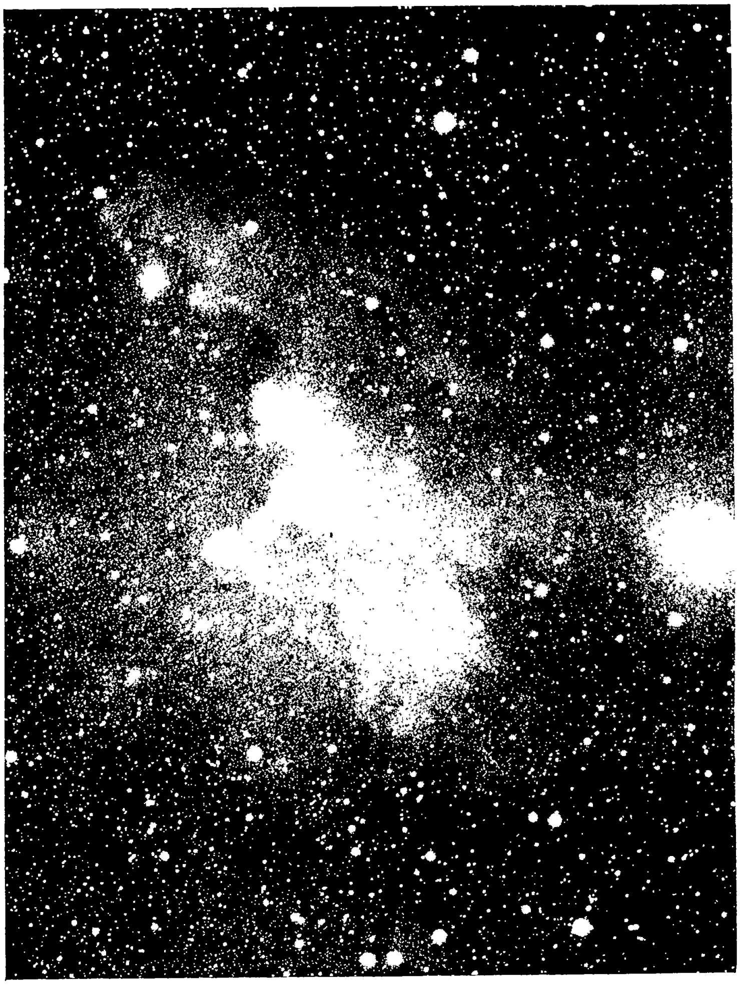

FIG. 1.

FIG. 2.

GREAT NEBULA OF ψ ERIDANI. DR. MAX WOLF, HEIDELBERG.

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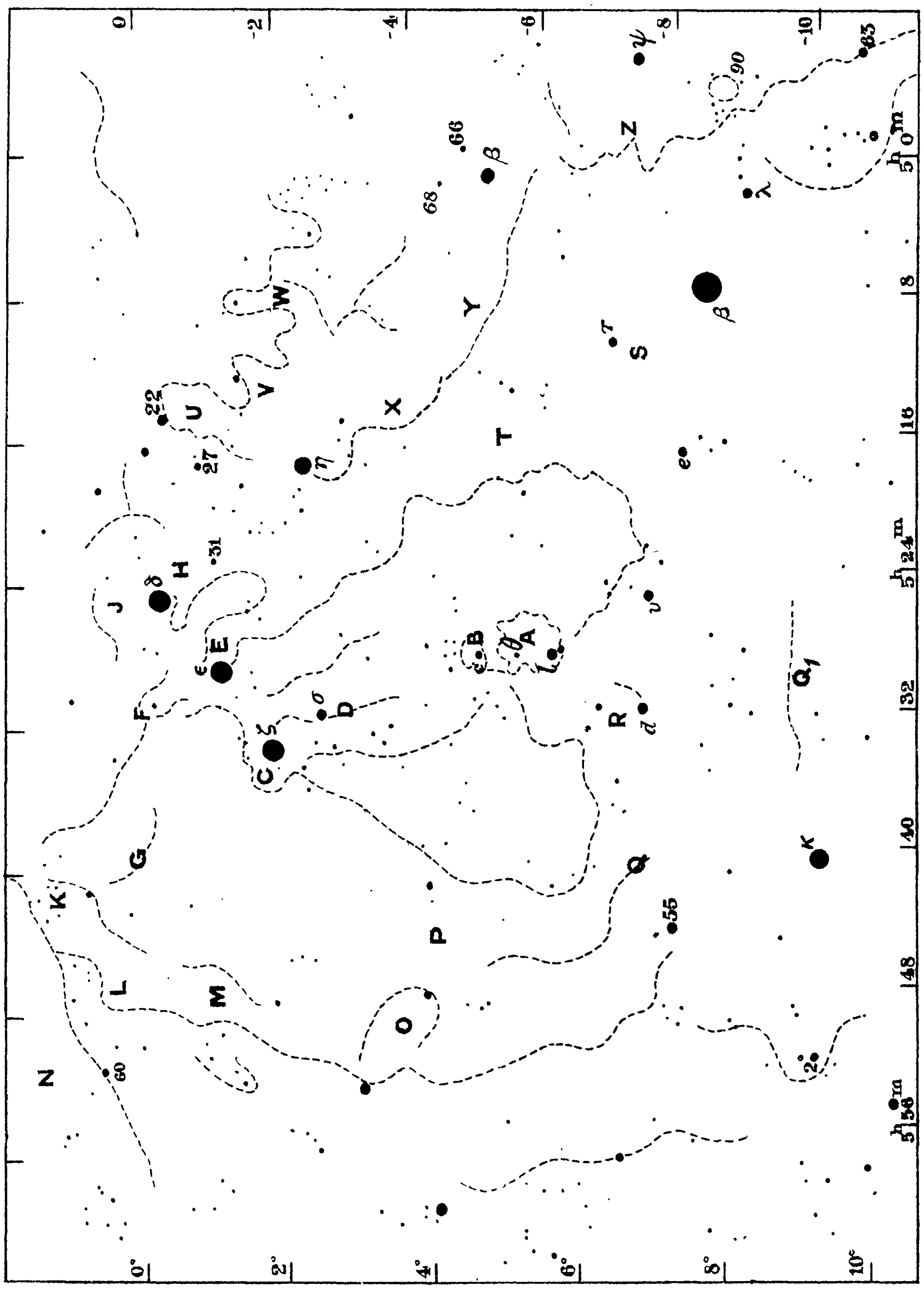

SKETCH MAP OF NEBULÆ IN SOUTHERN PART OF ORION.

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FIG. I.

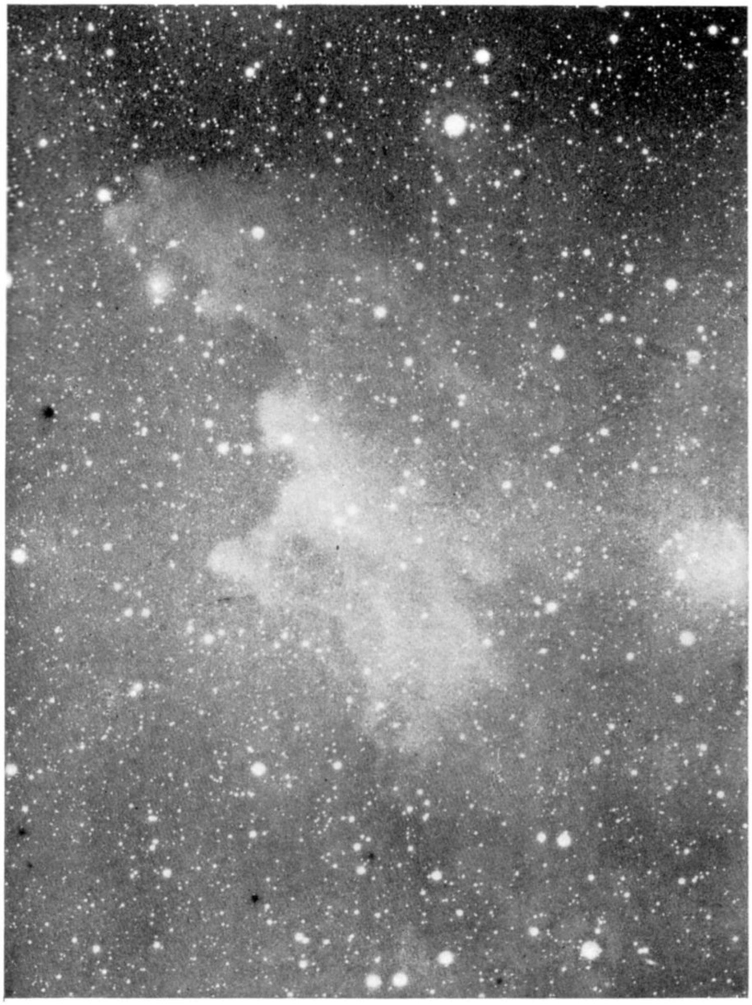
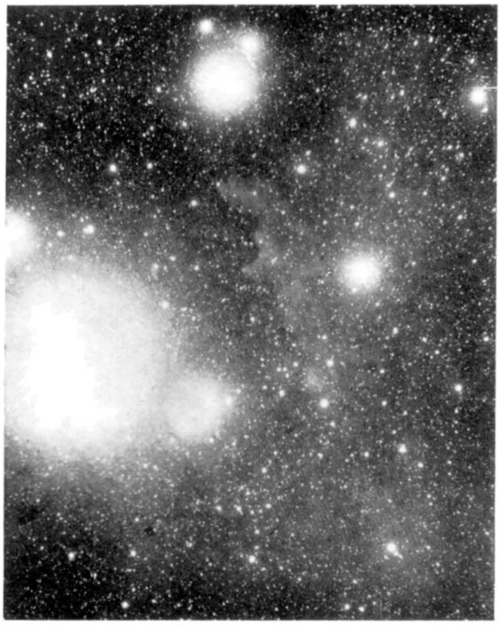


FIG. 2.



GREAT NEBULA OF ψ ERIDANI. DR. MAX WOLF, HEIDELBERG.